SEQUENCE LISTING

```
<110>  EXELIXIS, INC.

<120>  PRKCS AS MODIFIERS OF THE BETA CATENIN PATHWAY AND METHODS OF USE

<130>  EX04-056C-PC

<150>  US 60/495,172
<151>  2003-08-14

<160>  12

<170>  PatentIn version 3.2

<210>  1
<211>  2261
<212>  DNA
<213>  Homo sapiens

<400>  1
ccgcggttcc ggctgctccg gcgaggcgac ccttgggtcg gcgctgcggg cgaggtgggc        60

aggtaggtgg gcggacggcc gcggttctcc ggcaagcgca ggcggcggag tccccacgg       120

cgcccgaagc gccccccgca cccccggcct ccagcgttga ggcggggggag tgaggagatg      180

ccgacccaga gggacagcag caccatgtcc cacacggtcg caggcggcgg cagcggggac       240

cattcccacc aggtccgggt gaaagcctac taccgcgggg atatcatgat aacacatttt      300

gaaccttcca tctcctttga gggcctttgc aatgaggttc gagacatgtg ttcttttgac      360

aacgaacagc tcttcaccat gaaatggata gatgaggaag gagacccgtg tacagtatca      420

tctcagttgg agttagaaga agcctttaga ctttatgagc taaacaagga ttctgaactc      480

ttgattcatg tgttcccttg tgtaccagaa cgtcctggga tgccttgtcc aggagaagat      540

aaatccatct accgtagagg tgcacgccgc tggagaaagc tttattgtgc caatggccac      600

actttccaag ccaagcgttt caacaggcgt gctcactgtg ccatctgcac agaccgaata      660

tggggacttg gacgccaagg atataagtgc atcaactgca aactcttggt tcataagaag      720

tgccataaac tcgtcacaat tgaatgtggg cggcattctt tgccacagga accagtgatg      780

cccatggatc agtcatccat gcattctgac catgcacaga cagtaattcc atataatcct      840

tcaagtcatg agagtttgga tcaagttggt gaagaaaaag aggcaatgaa caccagggaa      900

agtggcaaag cttcatccag tctaggtctt caggattttg atttgctccg ggtaatagga      960

agaggaagtt atgccaaagt actgttggtt cgattaaaaa aaacagatcg tatttatgca     1020

atgaaagttg tgaaaaaaga gcttgttaat gatgatgagg atattgattg ggtacagaca     1080
```

```
gagaagcatg  tgtttgagca  ggcatccaat  catcctttcc  ttgttgggct  gcattcttgc   1140

tttcagacag  aaagcagatt  gttctttgtt  atagagtatg  taaatggagg  agacctaatg   1200

tttcatatgc  agcgacaaag  aaaacttcct  gaagaacatg  ccagatttta  ctctgcagaa   1260

atcagtctag  cattaaatta  tcttcatgag  cgagggataa  tttatagaga  tttgaaactg   1320

gacaatgtat  tactggactc  tgaaggccac  attaaactca  ctgactacgg  catgtgtaag   1380

gaaggattac  ggccaggaga  tacaaccagc  actttctgtg  gtactcctaa  ttacattgct   1440

cctgaaattt  taagaggaga  agattatggt  ttcagtgttg  actggtgggc  tcttggagtg   1500

ctcatgtttg  agatgatggc  aggaaggtct  ccatttgata  ttgttgggag  ctccgataac   1560

cctgaccaga  acacagagga  ttatctcttc  caagttattt  tggaaaaaca  aattcgcata   1620

ccacgttctc  tgtctgtaaa  agctgcaagt  gttctgaaga  gttttcttaa  taaggaccct   1680

aaggaacgat  tgggttgtca  tcctcaaaca  ggatttgctg  atattcaggg  acacccgttc   1740

ttccgaaatg  ttgattggga  tatgatggag  caaaaacagg  tggtacctcc  ctttaaacca   1800

aatatttctg  gggaatttgg  tttggacaac  tttgattctc  agtttactaa  tgaacctgtc   1860

cagctcactc  cagatgacga  tgacattgtg  aggaagattg  atcagtctga  atttgaaggt   1920

tttgagtata  tcaatcctct  tttgatgtct  gcagaagaat  gtgtctgatc  ctcatttttc   1980

aaccatgtat  tctactcatg  ttgccattta  atgcatggat  aaacttgctg  caagcctgga   2040

tacaattaac  cattttatat  ttgccaccta  caaaaaaaca  cccaatatct  tctcttgtag   2100

actatatgaa  tcaattatta  catctgtttt  actatgaaaa  aaaaattaat  actactagct   2160

tccagacaat  catgtcaaaa  tttagttgaa  ctggtttttc  agtttttaaa  aggcctacag   2220

atgagtaatg  aagttacctt  ttttgtttaa  aaaaaaaaa g                          2261
```

```
<210>  2
<211>  2325
<212>  DNA
<213>  Homo sapiens

<400>  2
agcggttttg  ggcccgggcg  gctgtagagg  cggcggcgcc  tacgggcagt  gggaggagcc    60

gcgcggttcc  ggctgctccg  gcgaggcgac  ccttgggtcg  gcgctgcggg  cgaggtgggc   120

aggtaggtgg  gcggacggcc  gcggttctcc  ggcaagcgca  ggcggcggag  tcccccacgg   180

cgcccgaagc  gccccccgc   accccggcc   tccagcgttg  aggcggggga  gtgaggagat   240

gccgacccag  agggacagca  gcaccatgtc  ccacacggtc  gcaggcggcg  gcagcgggga   300
```

```
ccattcccac caggtccggg tgaaagccta ctaccgcggg gatatcatga taacacattt    360

tgaaccttcc atctcctttg agggcctttg caatgaggtt cgagacatgt gttcttttga    420

caacgaacag ctcttcacca tgaaatggat agatgaggaa ggagacccgt gtacagtatc    480

atctcagttg gagttagaag aagcctttag actttatgag ctaaacaagg attctgaact    540

cttgattcat gtgttccctt gtgtaccaga acgtcctggg atgccttgtc caggagaaga    600

taaatccatc taccgtagag gtgcacgccg ctggagaaag ctttattgtg ccaatggcca    660

cactttccaa gccaagcgtt tcaacaggcg tgctcactgt gccatctgca cagaccgaat    720

atggggactt ggacgccaag gatataagtg catcaactgc aaactcttgg ttcataagaa    780

gtgccataaa ctcgtcacaa ttgaatgtgg gcggcattct ttgccacagg aaccagtgat    840

gcccatggat cagtcatcca tgcattctga ccatgcacag acagtaattc catataatcc    900

ttcaagtcat gagagtttgg atcaagttgg tgaagaaaaa gaggcaatga acaccaggga    960

aagtggcaaa gcttcatcca gtctaggtct tcaggatttt gatttgctcc gggtaatagg   1020

aagaggaagt tatgccaaag tactgttggt tcgattaaaa aaaacagatc gtatttatgc   1080

aatgaaagtt gtgaaaaaag agcttgttaa tgatgatgag gatattgatt gggtacagac   1140

agagaagcat gtgtttgagc aggcatccaa tcatcctttc cttgttgggc tgcattcttg   1200

ctttcagaca gaaagcagat tgttctttgt tatagagtat gtaaatggag gagacctaat   1260

gtttcatatg cagcgacaaa gaaaacttcc tgaagaacat gccagatttt actctgcaga   1320

aatcagtcta gcattaaatt atcttcatga gcgagggata atttatagag atttgaaact   1380

ggacaatgta ttactggact ctgaaggcca cattaaactc actgactacg gcatgtgtaa   1440

ggaaggatta cggccaggag atacaaccag cactttctgt ggtactccta attacattgc   1500

tcctgaaatt ttaagaggag aagattatgg tttcagtgtt gactggtggg ctcttggagt   1560

gctcatgttt gagatgatgg caggaaggtc tccatttgat attgttggga gctccgataa   1620

ccctgaccag aacacagagg attatctctt ccaagttatt ttggaaaaac aaattcgcat   1680

accacgttct atgtctgtaa aagctgcaag tgttctgaag agttttctta ataaggaccc   1740

taaggaacga ttgggttgtc ttcctcaaac aggatttgct gatattcagg acacccgtt    1800

cttccgaaat gttgattggg atatgatgga gcaaaaacag gtggtacctc cctttaaacc   1860

aaatatttct ggggaatttg gtttggacaa ctttgattct cagtttacta atgaacgtgt   1920

ccagctcact ccagatgacg atgacattgt gaggaagatt gatcagtctg aatttgaagg   1980

ttttgagtat atcaatcctc ttttgatgtc tgcagaagaa tgtgtctgat cctcattttt   2040
```

```
caaccatgta ttctactcat gttgccattt aatgcatgga taaacttgct gcaagcctgg   2100

atacaattaa ccattttata tttgccacct acaaaaaaac acccaatatc ttctcttgta   2160

gactatatga atcaattatt acatctgttt tactatgaaa aaaaaattaa tactactagc   2220

ttccagacaa tcatgtcaaa atttagttga actggttttt cagtttttaa aaggcctaca   2280

gatgagtaat gaagttatct tttttgttta aaaaaaaaaa aaaaa                   2325
```

<210> 3
<211> 2261
<212> DNA
<213> Homo sapiens

<400> 3
```
ccgcggttcc ggctgctccg gcgaggcgac ccttgggtcg gcgctgcggg cgaggtgggc     60

aggtaggtgg gcggacggcc gcggttctcc ggcaagcgca ggcggcggag tcccccacgg    120

cgcccgaagc gccccccgca cccccggcct ccagcgttga ggcggggggag tgaggagatg    180

ccgacccaga gggacagcag caccatgtcc cacacggtcg caggcggcgg cagcggggac    240

cattcccacc aggtccgggt gaaagcctac taccgcgggg atatcatgat aacacatttt    300

gaaccttcca tctcctttga gggcctttgc aatgaggttc gagacatgtg ttcttttgac    360

aacgaacagc tcttcaccat gaaatggata gatgaggaag agacccgtg tacagtatca    420

tctcagttgg agttagaaga agcctttaga ctttatgagc taaacaagga ttctgaactc    480

ttgattcatg tgttcccttg tgtaccagaa cgtcctggga tgccttgtcc aggagaagat    540

aaatccatct accgtagagg tgcacgccgc tggagaaagc tttattgtgc caatggccac    600

actttccaag ccaagcgttt caacaggcgt gctcactgtg ccatctgcac agaccgaata    660

tggggacttg gacgccaagg atataagtgc atcaactgca aactcttggt tcataagaag    720

tgccataaac tcgtcacaat tgaatgtggg cggcattctt gccacagga accagtgatg    780

cccatggatc agtcatccat gcattctgac catgcacaga cagtaattcc atataatcct    840

tcaagtcatg agagtttgga tcaagttggt gaagaaaaag aggcaatgaa caccagggaa    900

agtggcaaag cttcatccag tctaggtctt caggattttg atttgctccg ggtaatagga    960

agaggaagtt atgccaaagt actgttggtt cgattaaaaa aaacagatcg tatttatgca   1020

atgaaagttg tgaaaaaaga gcttgttaat gatgatgagg atattgattg ggtacagaca   1080

gagaagcatg tgtttgagca ggcatccaat catcctttcc ttgttgggct gcattcttgc   1140

tttcagacag aaagcagatt gttctttgtt atagagtatg taaatggagg agacctaatg   1200
```
```
                                    4
```

```
tttcatatgc agcgacaaag aaaacttcct gaagaacatg ccagatttta ctctgcagaa   1260

atcagtctag cattaaatta tcttcatgag cgagggataa tttatagaga tttgaaactg   1320

gacaatgtat tactggactc tgaaggccac attaaactca ctgactacgg catgtgtaag   1380

gaaggattac ggccaggaga tacaaccagc actttctgtg gtactcctaa ttacattgct   1440

cctgaaattt taagaggaga agattatggt ttcagtgttg actggtgggc tcttggagtg   1500

ctcatgtttg agatgatggc aggaaggtct ccatttgata ttgttgggag ctccgataac   1560

cctgaccaga acacagagga ttatctcttc caagttattt tggaaaaaca aattcgcata   1620

ccacgttctc tgtctgtaaa agctgcaagt gttctgaaga gttttcttaa taaggaccct   1680

aaggaacgat tgggttgtca tcctcaaaca ggatttgctg atattcaggg cacccgttc    1740

ttccgaaatg ttgattggga tatgatggag caaaaacagg tggtacctcc ctttaaacca   1800

aatatttctg gggaatttgg tttggacaac tttgattctc agtttactaa tgaacctgtc   1860

cagctcactc cagatgacga tgacattgtg aggaagattg atcagtctga atttgaaggt   1920

tttgagtata tcaatcctct tttgatgtct gcagaagaat gtgtctgatc ctcattttc    1980

aaccatgtat tctactcatg ttgccattta atgcatggat aaacttgctg caagcctgga   2040

tacaattaac cattttatat ttgccaccta caaaaaaaca cccaatatct tctcttgtag   2100

actatatgaa tcaattatta catctgtttt actatgaaaa aaaaattaat actactagct   2160

tccagacaat catgtcaaaa tttagttgaa ctggtttttc agtttttaaa aggcctacag   2220

atgagtaatg aagttacctt ttttgtttaa aaaaaaaaa g                        2261
```

```
<210>  4
<211>  2320
<212>  DNA
<213>  Homo sapiens

<400>  4
ttttgggccc gggcggctgt agaggcggcg gcgcctacgg gcagtgggag gagccgcgcg   60

gttccggctg ctccggcgag gcgacccttg ggtcggcgct gcgggcgagg tgggcaggta   120

ggtgggcgga cggccgcggt tctccggcaa gcgcaggcgg cggagtcccc cacggcgccc   180

gaagcgcccc cccgcacccc cggcctccag cgttgaggcg ggggagtgag gagatgccga   240

cccagaggga cagcagcacc atgtcccaca cggtcgcagg cggcggcagc ggggaccatt   300

cccaccaggt ccgggtgaaa gcctactacc gcggggatat catgataaca cattttgaac   360

cttccatctc ctttgagggc ctttgcaatg aggttcgaga catgtgttct tttgacaacg   420
```

```
aacagctctt caccatgaaa tggatagatg aggaaggaga cccgtgtaca gtatcatctc   480

agttggagtt agaagaagcc tttagacttt atgagctaaa caaggattct gaactcttga   540

ttcatgtgtt cccttgtgta ccagaacgtc ctgggatgcc ttgtccagga gaagataaat   600

ccatctaccg tagaggtgca cgccgctgga gaaagcttta ttgtgccaat ggccacactt   660

tccaagccaa gcgtttcaac aggcgtgctc actgtgccat ctgcacagac cgaatatggg   720

gacttggacg ccaaggatat aagtgcatca actgcaaact cttggttcat aagaagtgcc   780

ataaactcgt cacaattgaa tgtgggcggc attctttgcc acaggaacca gtgatgccca   840

tggatcagtc atccatgcat tctgaccatg cacagacagt aattccatat aatccttcaa   900

gtcatgagag tttggatcaa gttggtgaag aaaaagaggc aatgaacacc agggaaagtg   960

gcaaagcttc atccagtcta ggtcttcagg attttgattt gctccgggta ataggaagag  1020

gaagttatgc caaagtactg ttggttcgat taaaaaaaac agatcgtatt tatgcaatga  1080

aagttgtgaa aaaagagctt gttaatgatg atgaggatat tgattgggta cagacagaga  1140

agcatgtgtt tgagcaggca tccaatcatc ctttccttgt tgggctgcat tcttgctttc  1200

agacagaaag cagattgttc tttgttatag agtatgtaaa tggaggagac ctaatgtttc  1260

atatgcagcg acaaagaaaa cttcctgaag aacatgccag attttactct gcagaaatca  1320

gtctagcatt aaattatctt catgagcgag ggataattta tagagatttg aaactggaca  1380

atgtattact ggactctgaa ggccacatta aactcactga ctacggcatg tgtaaggaag  1440

gattacggcc aggagataca accagcactt tctgtggtac tcctaattac attgctcctg  1500

aaattttaag aggagaagat tatggtttca gtgttgactg gtgggctctt ggagtgctca  1560

tgtttgagat gatggcagga aggtctccat ttgatattgt tgggagctcc gataaccctg  1620

accagaacac agaggattat ctcttccaag ttattttgga aaaacaaatt cgcataccac  1680

gttctatgtc tgtaaaagct gcaagtgttc tgaagagttt tcttaataag gaccctaagg  1740

aacgattggg ttgtcttcct caaacaggat ttgctgatat tcagggacac ccgttcttcc  1800

gaaatgttga ttgggatatg atggagcaaa aacaggtggt acctcccttt aaaccaaata  1860

tttctgggga atttggtttg gacaactttg attctcagtt tactaatgaa cgtgtccagc  1920

tcactccaga tgacgatgac attgtgagga agattgatca gtctgaattt gaaggttttg  1980

agtatatcaa tcctcttttg atgtctgcag aagaatgtgt ctgatcctca tttttcaacc  2040

atgtattcta ctcatgttgc catttaatgc atggataaac ttgctgcaag cctggataca  2100
```

```
attaaccatt ttatatttgc cacctacaaa aaaacaccca atatcttctc ttgtagacta    2160

tatgaatcaa ttattacatc tgttttacta tgaaaaaaaa attaatacta ctagcttcca    2220

gacaatcatg tcaaaattta gttgaactgg tttttcagtt tttaaaaggc ctacagatga    2280

gtaatgaagt tatctttttt gtttaaaaaa aaaaaaaaaa                          2320
```

<210> 5
<211> 2320
<212> DNA
<213> Homo sapiens

<400> 5
```
ttttgggccc gggcggctgt agaggcggcg gcgcctacgg gcagtgggag gagccgcgcg      60

gttccggctg ctccggcgag gcgacccttg ggtcggcgct gcgggcgagg tgggcaggta     120

ggtgggcgga cggccgcggt tctccggcaa gcgcaggcgg cggagtcccc cacggcgccc     180

gaagcgcccc cccgcacccc cggcctccag cgttgaggcg ggggagtgag gagatgccga     240

cccagaggga cagcagcacc atgtcccaca cggtcgcagg cggcggcagc ggggaccatt     300

cccaccaggt ccgggtgaaa gcctactacc gcggggatat catgataaca cattttgaac     360

cttccatctc ctttgagggc ctttgcaatg aggttcgaga catgtgttct tttgacaacg     420

aacagctctt caccatgaaa tggatagatg aggaaggaga cccgtgtaca gtatcatctc     480

agttggagtt agaagaagcc tttagacttt atgagctaaa caaggattct gaactcttga     540

ttcatgtgtt cccttgtgta ccagaacgtc ctgggatgcc ttgtccagga gaagataaat     600

ccatctaccg tagaggtgca cgccgctgga gaaagcttta ttgtgccaat ggccacactt     660

tccaagccaa gcgtttcaac aggcgtgctc actgtgccat ctgcacagac cgaatatggg     720

gacttggacg ccaaggatat aagtgcatca actgcaaact cttggttcat aagaagtgcc     780

ataaactcgt cacaattgaa tgtgggcggc attctttgcc acaggaacca gtgatgccca     840

tggatcagtc atccatgcat tctgaccatg cacagacagt aattccatat aatccttcaa     900

gtcatgagag tttggatcaa gttggtgaag aaaaagaggc aatgaacacc agggaaagtg     960

gcaaagcttc atccagtcta ggtcttcagg attttgattt gctccgggta ataggaagag    1020

gaagttatgc caaagtactg ttggttcgat taaaaaaaac agatcgtatt tatgcaatga    1080

aagttgtgaa aaaagagctt gttaatgatg atgaggatat tgattgggta cagacagaga    1140

agcatgtgtt tgagcaggca tccaatcatc ctttccttgt tgggctgcat tcttgctttc    1200

agacagaaag cagattgttc tttgttatag agtatgtaaa tggaggagac ctaatgtttc    1260
```

7

```
atatgcagcg acaaagaaaa cttcctgaag aacatgccag attttactct gcagaaatca   1320

gtctagcatt aaattatctt catgagcgag ggataattta tagagatttg aaactggaca   1380

atgtattact ggactctgaa ggccacatta aactcactga ctacggcatg tgtaaggaag   1440

gattacggcc aggagataca accagcactt tctgtggtac tcctaattac attgctcctg   1500

aaatttaag aggagaagat tatggtttca gtgttgactg gtgggctctt ggagtgctca   1560

tgtttgagat gatggcagga aggtctccat ttgatattgt tgggagctcc gataaccctg   1620

accagaacac agaggattat ctcttccaag ttattttgga aaaacaaatt cgcataccac   1680

gttctatgtc tgtaaaagct gcaagtgttc tgaagagttt tcttaataag gaccctaagg   1740

aacgattggg ttgtcttcct caaacaggat ttgctgatat tcagggacac ccgttcttcc   1800

gaaatgttga ttgggatatg atggagcaaa aacaggtggt acctcccttt aaaccaaata   1860

tttctgggga atttggtttg gacaactttg attctcagtt tactaatgaa cgtgtccagc   1920

tcactccaga tgacgatgac attgtgagga agattgatca gtctgaattt gaaggttttg   1980

agtatatcaa tcctctttttg atgtctgcag aagaatgtgt ctgatcctca tttttcaacc   2040

atgtattcta ctcatgttgc catttaatgc atggataaac ttgctgcaag cctggataca   2100

attaaccatt ttatatttgc cacctacaaa aaaacaccca atatcttctc ttgtagacta   2160

tatgaatcaa ttattacatc tgttttacta tgaaaaaaaa attaatacta ctagcttcca   2220

gacaatcatg tcaaaattta gttgaactgg tttttcagtt tttaaaaggc ctacagatga   2280

gtaatgaagt tatctttttt gtttaaaaaa aaaaaaaaa                          2320
```

```
<210>   6
<211>   2164
<212>   DNA
<213>   Homo sapiens

<400>   6
atgcccagca ggaccgaccc caagatggaa gggagcggcg gccgcgtccg cctcaaggcg   60

cattacgggg gggacatctt catcaccagc gtggacgccg ccacgacctt cgaggagctc   120

tgtgaggaag tgagagacat gtgtcgtctg caccagcagc acccgctcac cctcaagtgg   180

gtggacagcg aaggtgaccc ttgcacggtg tcctcccaga tggagctgga agaggctttc   240

cgcctggccc gtcagtgcag ggatgaaggc ctcatcattc atgtttttccc gagcacccct   300

gagcagcctg gcctgccatg tccgggagaa gacaaatcta tctaccgccg gggagccaga   360

agatggagga agctgtaccg tgccaacggc cacctcttcc aagccaagcg ctttaacagg   420
```

```
agagcgtact  gcggtcagtg  cagcgagagg  atatggggcc  tcgcgaggca  aggctacagg      480

tgcatcaact  gcaaactgct  ggtccataag  cgctgccacg  gcctcgtccc  gctgacctgc      540

aggaagcata  tggattctgt  catgccttcc  caagagcctc  cagtagacga  caagaacgag      600

gacgccgacc  ttccttccga  ggagacagat  ggaattgctt  acatttcctc  atcccggaag      660

catgacagca  ttaaagacga  ctcggaggac  cttaagccag  ttatcgatgg  gatggatgga      720

atcaaaatct  ctcaggggct  tgggctgcag  gactttgacc  taatcagagt  catcgggcgc      780

gggagctacg  ccaaggttct  cctggtgcgg  ttgaagaaga  atgaccaaat  ttacgccatg      840

aaagtggtga  agaaagagct  ggtgcatgat  gacgaggata  ttgactgggt  acagacagag      900

aagcacgtgt  ttgagcaggc  atccagcaac  cccttcctgg  tcggattaca  ctcctgcttc      960

cagacgacaa  gtcggttgtt  cctggtcatt  gagtacgtca  acggcgggga  cctgatgttc     1020

cacatgcaga  ggcagaggaa  gctccctgag  gagcacgcca  ggttctacgc  ggccgagatc     1080

tgcatcgccc  tcaacttcct  gcacgagagg  gggatcatct  acagggacct  gaagctggac     1140

aacgtcctcc  tggatgcgga  cgggcacatc  aagctcacag  actacggcat  gtgcaaggaa     1200

ggcctgggcc  ctggtgacac  aacgagcact  ttctgcggaa  ccccgaatta  catcgccccc     1260

gaaatcctgc  ggggagagga  gtacgggttc  agcgtggact  ggtgggcgct  gggagtcctc     1320

atgtttgaga  tgatggccgg  gcgctccccg  ttcgacatca  tcaccgacaa  cccggacatg     1380

aacacagagg  actacctttt  ccaagtgatc  ctggagaagc  ccatccggat  cccccggttc     1440

ctgtccgtca  aagcctccca  tgttttaaaa  ggatttttaa  ataaggaccc  caaagagagg     1500

ctcggctgcc  ggccacagac  tggattttct  gacatcaagt  cccacgcgtt  cttccgcagc     1560

atagactggg  acttgctgga  gaagaagcag  gcgctccctc  cattccagcc  acagatcaca     1620

gacgactacg  gtctggacaa  ctttgacaca  cagttcacca  gcgagcccgt  gcagctgacc     1680

ccagacgatg  aggatgccat  aaagaggatc  gaccagtcag  agttcgaagg  ctttgagtat     1740

atcaacccat  tattgctgtc  caccgaggag  tcggtgtgag  gccgcgtgcg  tctctgtcgt     1800

ggacacgcgt  gattgaccct  ttaactgtat  ccttaaccac  cgcatatgca  tgccaggctg     1860

ggcacggctc  cgagggcggc  cagggacaga  cgcttgcgcc  gagaccgcag  agggaagcgt     1920

cagcgggcgc  tgctgggagc  agaacagtcc  ctcacacctg  gcccggcagg  cagcttcgtg     1980

ctggaggaac  ttgctgctgt  gcctgcgtcg  cggcggatcc  gcggggaccc  tgccgagggg     2040

gctgtcatgc  ggtttccaag  gtgcacattt  tccacggaaa  cagaactcga  tgcactgacc     2100

tgctccgcca  ggaaagtgag  cgtgtagcgt  cctgaggaat  aaaatgttcc  gatgaaaaaa     2160
```

```
aaaa                                                                    2164


<210>  7
<211>  2315
<212>  DNA
<213>  Homo sapiens

<400>  7
ggcacgaggc tgagcgctgc cttccgcgtt ccgccgcggc cccacctgga gccccgccc      60

cgcgccatgg ccggagctcc cggggcgcag cgctgacggc ggcggggga  gcgcgccatg     120

cccagcagga ccggccccaa gatggaaggg agcggcggcc gcgtccgcct caaggcgcat     180

tacgggggg  acatcttcat caccagcgtg gacgccgcca cgaccttcga ggagctctgt     240

gaggaagtga gagacatgtg tcgtctgcac cagcagcacc cgctcaccct caagtgggtg     300

gacagcgaag gtgacccttg cacggtgtcc tcccagatgg agctggaaga ggctttccgc     360

ctggcccgtc agtgcaggga tgaaggcctc atcattcatg ttttcccgag cacccctgag     420

cagcctggcc tgccatgtcc gggagaagac aaatctatct accgccgggg agccagaaga     480

tggaggaagc tgtaccgtgc caacggccac ctcttccaag ccaagcgctt taacaggaga     540

gcgtactgcg gtcagtgcag cgagaggata tggggcctcg cgaggcaagg ctacaggtgc     600

atcaactgca aactgctggt ccataagcgc tgccacggcc tcgtcccgct gacctgcagg     660

aagcatatgg attctgtcat gccttcccaa gagcctccag tagacgacaa gaacgaggac     720

gccgaccttc cttccgagga gacagatgga attgcttaca tttcctcatc ccggaagcat     780

gacagcatta aagacgactc ggaggacctt aagccagtta tcgatgggat ggatggaatc     840

aaaatctctc aggggcttgg gctgcaggac tttgacctaa tcagagtcat cgggcgcggg     900

agctacgcca aggttctcct ggtgcggttg aagaagaatg accaaattta cgccatgaaa     960

gtggtgaaga aagagctggt gcatgatgac gaggatattg actgggtaca gacagagaag    1020

cacgtgtttg agcaggcatc cagcaaccce ttcctggtcg gattacactc ctgcttccag    1080

acgacaagtc ggttgttcct ggtcattgag tacgtcaacg gcggggacct gatgttccac    1140

atgcagaggc agaggaagct ccctgaggag cacgccaggt tctacgcggc cgagatctgc    1200

atcgccctca acttcctgca cgagagggg  atcatctaca gggacctgaa gctggacaac    1260

gtcctcctgg atgcggacgg gcacatcaag ctcacagact acggcatgtg caaggaaggc    1320

ctgggccctg gtgacacaac gagcactttc tgcggaaccc cgaattacat cgcccccgaa    1380

atcctgcggg gagaggagta cgggttcagc gtggactggt gggcgctggg agtcctcatg    1440
```

```
tttgagatga tggccgggcg ctccccgttc gacatcatca ccgacaaccc ggacatgaac   1500

acagaggact accttttcca agtgatcctg gagaagccca tccggatccc ccggttcctg   1560

tccgtcaaag cctcccatgt tttaaaagga tttttaaata aggaccccaa agagaggctc   1620

ggctgccggc cacagactgg attttctgac atcaagtccc acgcgttctt ccgcagcata   1680

gactgggact tgctggagaa gaagcaggcg ctccctccat tccagccaca gatcacagac   1740

gactacggtc tggacaactt tgacacacag ttcaccagcg agcccgtgca gctgacccca   1800

gacgatgagg atgccataaa gaggatcgac cagtcagagt cgaaggcctt tgagtatatc   1860

aacccattat tgctgtccac cgaggagtcg gtgtgaggcc gcgtgcgtct ctgtcgtgga   1920

cacgcgtgat tgacccttta actgtatcct taaccaccgc atatgcatgc caggctgggc   1980

acggctccga gggcggccag ggacagacgc ttgcgccgag accgcagagg gaagcgtcag   2040

cgggcgctgc tgggagcaga acagtccctc acacctgggc ccgggcaggc cagcttcgtg   2100

ctggaggaac ttgctgctgt gcctgcgtcg cggcggatcc gcggggaccc tgccgagggg   2160

gctgtcatgc ggtttccaag gtgcacattt tccacggaaa cagaactcga tgcactgacc   2220

tgctccgcca ggaaagtgag cgtgtagcgt cctgaggaat aaaatgttcc gatgatgtgg   2280

aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaa                               2315


<210>  8
<211>  1779
<212>  DNA
<213>  Homo sapiens

<400>  8
atgcccagca ggaccgaccc caagatggaa gggagcggcg ccgcgtccg cctcaaggcg     60

cattacgggg gggacatctt catcaccagc gtggacgccg ccacgacctt cgaggagctc    120

tgtgaggaag tgagagacat gtgtcgtctg caccagcagc acccgctcac cctcaagtgg    180

gtggacagcg aaggtgaccc ttgcacggtg tcctcccaga tggagctgga agaggctttc    240

cgcctggccc gtcagtgcag ggatgaaggc ctcatcattc atgttttccc gagcacccct    300

gagcagcctg gcctgccatg tccgggagaa gacaaatcta tctaccgccg gggagccaga    360

agatggagga agctgtaccg tgccaacggc cacctcttcc aagccagcg ctttaacagg      420

agagcgtact gcggtcagtg cagcgagagg atatggggcc tcgcgaggca aggctacagg     480

tgcatcaact gcaaactgct ggtccataag cgctgccacg cctcgtccc gctgacctgc      540

aggaagcata tggattctgt catgccttcc caagagcctc cagtagacga caagaacgag     600
```

```
gacgccgacc ttccttccga ggagacagat ggaattgctt acatttcctc atcccggaag    660

catgacagca ttaaagacga ctcggaggac cttaagccag ttatcgatgg gatggatgga    720

atcaaaatct ctcaggggct tgggctgcag gactttgacc taatcagagt catcgggcgc    780

gggacgtacg ccaaggttct cctggtgcgg ttgaagaàga atgaccaaat ttacgccatg    840

aaagtggtga agaaagagct ggtgcatgat gacgaggata ttgactgggt acagacagag    900

aagcacgtgt ttgagcaggc atccagcaac cccttcctgg tcggattaca ctcctgcttc    960

cagacgacaa gtcggttgtt cctggtcatt gagtacgtca acggcgggga cctgatgttc   1020

cacatgcaga ggcagaggaa gctccctgag gagcacgcca ggttctacgc ggccgagatc   1080

tgcatcgccc tcaacttcct gcacgagagg gggatcatct acagggacct gaagctggac   1140

aacgtcctcc tggatgcgga cggacacatc aagctcacag actacggcat gtgcaaggaa   1200

ggcctgggcc ctggtgacac aacgagcact ttctgcggaa ccccgaatta catcgccccc   1260

gaaatcctgc ggggagagga gtacgggttc agcgtggact ggtgggcgct gggagtcctc   1320

atgtttgaga tgatggccgg gcgctccccg ttcgacatca tcaccgacaa cccggacatg   1380

aacacagagg actacctttt ccaagtgatc ctggagaagc catccggat ccccgggttc    1440

ctgtccgtca aagcctccca tgtttaaaa ggatttttaa ataaggaccc caaagagagg    1500

ctcggctgcc ggccacagac tggatttttct gacatcaagt cccacgcgtt cttccgcagc   1560

atagactggg acttgctgga gaagaagcag gcgctccctc cattccagcc acagatcaca   1620

gacgactacg gtctggacaa cttttgacaca cagttcacca gcgagcccgt gcagctgacc   1680

ccagacgatg aggatgccat aaagaggatc gaccagtcag agttcgaagg ctttgagtat   1740

atcaacccat tattgctgtc caccgaggag tcggtgtga                           1779
```

<210> 9
<211> 2306
<212> DNA
<213> Homo sapiens

<400> 9
```
ctgagcgctg ccttccgcgt tccgccgcgg ccccacctgg agcccccgcc ccgcgccatg     60

gccggagctc ccggggcgca gcgctgacgg cggcgggggg agcgcgccat gcccagcagg    120

accggcccca agatggaagg gagcggcggc cgcgtccgcc tcaaggcgca ttacgggggg    180

gacatcttca tcaccagcgt ggacgccgcc acgaccttcg aggagctctg tgaggaagtg    240

agagacatgt gtcgtctgca ccagcagcac ccgctcaccc tcaagtgggt ggacagcgaa    300
```

```
ggtgacccct gcacggtgtc ctcccagatg gagctggaag aggctttccg cctggcccgt    360

cagtgcaggg atgaaggcct catcattcat gttttcccga gcacccctga gcagcctggc    420

ctgccatgtc cgggagaaga caaatctatc taccgccggg gagccagaag atggaggaag    480

ctgtaccgtg ccaacggcca cctcttccaa gccaagcgct ttaacaggag agcgtactgc    540

ggtcagtgca gcgagaggat atggggcctc gcgaggcaag gctacaggtg catcaactgc    600

aaactgctgg tccataagcg ctgccacggc ctcgtcccgc tgacctgcag gaagcatatg    660

gattctgtca tgccttccca agagcctcca gtagacgaca agaacgagga cgccgacctt    720

ccttccgagg agacagatgg aattgcttac atttcctcat cccggaagca tgacagcatt    780

aaagacgact cggaggacct taagccagtt atcgatggga tggatggaat caaaatctct    840

caggggcttg ggctgcagga ctttgaccta atcagagtca tcgggcgcgg gagctacgcc    900

aaggttctcc tggtgcggtt gaagaagaat gaccaaattt acgccatgaa agtggtgaag    960

aaagagctgg tgcatgatga cgaggatatt gactgggtac agacagagaa gcacgtgttt   1020

gagcaggcat ccagcaaccc cttcctggtc ggattacact cctgcttcca gacgacaagt   1080

cggttgttcc tggtcattga gtacgtcaac ggcggggacc tgatgttcca catgcagagg   1140

cagaggaagc tccctgagga gcacgccagg ttctacgcgg ccgagatctg catcgccctc   1200

aacttcctgc acgagagggg gatcatctac agggacctga gctggacaa cgtcctcctg   1260

gatgcggacg ggcacatcaa gctcacagac tacggcatgt gcaaggaagg cctgggccct   1320

ggtgacacaa cgagcacttt ctgcggaacc ccgaattaca tcgcccccga aatcctgcgg   1380

ggagaggagt acgggttcag cgtggactgg tgggcgctgg agtcctcat gtttgagatg   1440

atggccgggc gctccccgtt cgacatcatc accgacaacc cggacatgaa cacagaggac   1500

tacctttttcc aagtgatcct ggagaagccc atccggatcc cccggttcct gtccgtcaaa   1560

gcctcccatg ttttaaaagg atttttaaat aaggacccca agagaggct cggctgccgg   1620

ccacagactg gatttctga catcaagtcc cacgcgttct tccgcagcat agactgggac   1680

ttgctggaga agaagcaggc gctccctcca ttccagccac agatcacaga cgactacggt   1740

ctggacaact ttgacacaca gttcaccagc gagcccgtgc agctgacccc agacgatgag   1800

gatgccataa agaggatcga ccagtcagag ttcgaaggct ttgagtatat caacccatta   1860

ttgctgtcca ccgaggagtc ggtgtgaggc cgcgtgcgtc tctgtcgtgg acacgcgtga   1920

ttgacccttt aactgtatcc ttaaccaccg catatgcatg ccaggctggg cacggctccg   1980
```

```
agggcggcca gggacagacg cttgcgccga gaccgcagag ggaagcgtca gcgggcgctg      2040

ctgggagcag aacagtccct cacacctggg cccgggcagg ccagcttcgt gctggaggaa      2100

cttgctgctg tgcctgcgtc gcggcggatc cgcggggacc ctgccgaggg ggctgtcatg      2160

cggtttccaa ggtgcacatt ttccacggaa acagaactcg atgcactgac ctgctccgcc      2220

aggaaagtga gcgtgtagcg tcctgaggaa taaaatgttc cgatgatgtg gaaaaaaaaa      2280

aaaaaaaaaa aaaaaaaaaa aaaaaa                                            2306
```

```
<210>   10
<211>   2340
<212>   DNA
<213>   Homo sapiens

<400>   10
gccccgcgcg ccgccggagt tccgcggagt tgaccgggtc ggcgccgtcg gtcctgagcg        60

ctgccttccg cgttccgccg cggccccacc tggagccccc gccccgcgcc atggccggag       120

ctcccggggc gcagcgctga cggcggcggg gggagcgcgc catgcccagc aggaccggcc       180

ccaagatgga agggagcggc ggccgcgtcc gcctcaaggc gcattacggg ggggacatct       240

tcatcaccag cgtggacgcc gccacgacct tcgaggagct ctgtgaggaa gtgagagaca       300

tgtgtcgtct gcaccagcag cacccgctca ccctcaagtg ggtggacagc gaaggtgacc       360

cttgcacggt gtcctcccag atggagctgg aagaggcttt ccgcctggcc cgtcagtgca       420

gggatgaagg cctcatcatt catgttttcc cgagcacccc tgagcagcct ggcctgccat       480

gtccgggaga agacaaatct atctaccgcc ggggagccag aagatggagg aagctgtacc       540

gtgccaacgg ccacctcttc caagccaagc gctttaacag gagagcgtac tgcggtcagt       600

gcagcgagag gatatggggc ctcgcgaggc aaggctacag gtgcatcaac tgcaaactgc       660

tggtccataa gcgctgccac ggcctcgtcc cgctgacctg caggaagcat atggattctg       720

tcatgccttc ccaagagcct ccagtagacg acaagaacga ggacgccgac cttccttccg       780

aggagacaga tggaattgct tacatttcct catcccggaa gcatgacagc attaaagacg       840

actcggagga ccttaagcca gttatcgatg ggatggatgg aatcaaaatc tctcaggggc       900

ttgggctgca ggactttgac ctaatcagag tcatcgggcg cgggagctac gccaaggttc       960

tcctggtgcg gttgaagaag aatgaccaaa tttacgccat gaaagtggtg aagaaagagc      1020

tggtgcatga tgacgaggat attgactggg tacagacaga gaagcacgtg tttgagcagg      1080

catccagcaa ccccttcctg gtcggattac actcctgctt ccagacgaca agtcggttgt      1140
```

```
tcctggtcat tgagtacgtc aacggcgggg acctgatgtt ccacatgcag aggcagagga      1200

agctccctga ggagcacgcc aggttctacg cggccgagat ctgcatcgcc ctcaacttcc      1260

tgcacgagag ggggatcatc tacagggacc tgaagctgga caacgtcctc ctggatgcgg      1320

acgggcacat caagctcaca gactacggca tgtgcaagga aggcctgggc cctggtgaca      1380

caacgagcac tttctgcgga accccgaatt acatcgcccc cgaaatcctg cggggagagg      1440

agtacgggtt cagcgtggac tggtgggcgc tgggagtcct catgtttgag atgatggccg      1500

ggcgctcccc gttcgacatc atcaccgaca acccggacat gaacacagag gactaccttt      1560

tccaagtgat cctggagaag cccatccgga tccccggtt cctgtccgtc aaagcctccc       1620

atgtttttaaa aggatttta aataaggacc ccaaagagag gctcggctgc cggccacaga      1680

ctggattttc tgacatcaag tcccacgcgt tcttccgcag catagactgg gacttgctgg      1740

agaagaagca ggcgctccct ccattccagc cacagatcac agacgactac ggtctggaca      1800

actttgacac acagttcacc agcgagcccg tgcagctgac cccagacgat gaggatgcca      1860

taaagaggat cgaccagtca gagttcgaag gctttgagta tatcaaccca ttattgctgt      1920

ccaccgagga gtcggtgtga ggccgcgtgc gtctctgtcg tggacacgcg tgattgaccc      1980

tttaactgta tccttaacca ccgcatatgc atgccaggct gggcacggct ccgagggcgg      2040

ccagggacag acgcttgcgc cgagaccgca gagggaagcg tcagcgggcg ctgctgggag      2100

cagaacagtc cctcacacct gggcccgggc aggccagctt cgtgctggag gaacttgctg      2160

ctgttcctgc gtcgcggcgg atccgcgggg accctgccga gggggctgtc atgcggtttc      2220

caaggtgcac attttccacg gaaacagaac tcgatgcact gacctgctcc gccaggaaag      2280

tgagcgtgta gcgtcctgag gaataaaatg ttccgatgaa aaaaaaaaaa aaaaaaaaaa      2340
```

```
<210>  11
<211>  587
<212>  PRT
<213>  Homo sapiens

<400>  11

Met Ser His Thr Val Ala Gly Gly Gly Ser Gly Asp His Ser His Gln
1               5                   10                  15


Val Arg Val Lys Ala Tyr Tyr Arg Gly Asp Ile Met Ile Thr His Phe
            20                  25                  30


Glu Pro Ser Ile Ser Phe Glu Gly Leu Cys Asn Glu Val Arg Asp Met
```

```
              35                     40                      45

Cys Ser Phe Asp Asn Glu Gln Leu Phe Thr Met Lys Trp Ile Asp Glu
    50              55              60

Glu Gly Asp Pro Cys Thr Val Ser Ser Gln Leu Glu Leu Glu Glu Ala
65              70              75                      80

Phe Arg Leu Tyr Glu Leu Asn Lys Asp Ser Glu Leu Leu Ile His Val
            85              90                  95

Phe Pro Cys Val Pro Glu Arg Pro Gly Met Pro Cys Pro Gly Glu Asp
            100             105             110

Lys Ser Ile Tyr Arg Arg Gly Ala Arg Arg Trp Arg Lys Leu Tyr Cys
        115             120             125

Ala Asn Gly His Thr Phe Gln Ala Lys Arg Phe Asn Arg Arg Ala His
    130             135             140

Cys Ala Ile Cys Thr Asp Arg Ile Trp Gly Leu Gly Arg Gln Gly Tyr
145             150             155             160

Lys Cys Ile Asn Cys Lys Leu Leu Val His Lys Lys Cys His Lys Leu
            165             170             175

Val Thr Ile Glu Cys Gly Arg His Ser Leu Pro Gln Glu Pro Val Met
        180             185             190

Pro Met Asp Gln Ser Ser Met His Ser Asp His Ala Gln Thr Val Ile
        195             200             205

Pro Tyr Asn Pro Ser Ser His Glu Ser Leu Asp Gln Val Gly Glu Glu
    210             215             220

Lys Glu Ala Met Asn Thr Arg Glu Ser Gly Lys Ala Ser Ser Ser Leu
225             230             235             240

Gly Leu Gln Asp Phe Asp Leu Leu Arg Val Ile Gly Arg Gly Ser Tyr
            245             250             255

Ala Lys Val Leu Leu Val Arg Leu Lys Lys Thr Asp Arg Ile Tyr Ala
        260             265             270
```

```
Met Lys Val Val Lys Lys Glu Leu Val Asn Asp Asp Glu Asp Ile Asp
    275             280             285

Trp Val Gln Thr Glu Lys His Val Phe Glu Gln Ala Ser Asn His Pro
    290             295             300

Phe Leu Val Gly Leu His Ser Cys Phe Gln Thr Glu Ser Arg Leu Phe
305             310             315             320

Phe Val Ile Glu Tyr Val Asn Gly Gly Asp Leu Met Phe His Met Gln
            325             330             335

Arg Gln Arg Lys Leu Pro Glu Glu His Ala Arg Phe Tyr Ser Ala Glu
        340             345             350

Ile Ser Leu Ala Leu Asn Tyr Leu His Glu Arg Gly Ile Ile Tyr Arg
        355             360             365

Asp Leu Lys Leu Asp Asn Val Leu Leu Asp Ser Glu Gly His Ile Lys
    370             375             380

Leu Thr Asp Tyr Gly Met Cys Lys Glu Gly Leu Arg Pro Gly Asp Thr
385             390             395             400

Thr Ser Thr Phe Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Ile Leu
            405             410             415

Arg Gly Glu Asp Tyr Gly Phe Ser Val Asp Trp Trp Ala Leu Gly Val
            420             425             430

Leu Met Phe Glu Met Met Ala Gly Arg Ser Pro Phe Asp Ile Val Gly
        435             440             445

Ser Ser Asp Asn Pro Asp Gln Asn Thr Glu Asp Tyr Leu Phe Gln Val
    450             455             460

Ile Leu Glu Lys Gln Ile Arg Ile Pro Arg Ser Leu Ser Val Lys Ala
465             470             475             480

Ala Ser Val Leu Lys Ser Phe Leu Asn Lys Asp Pro Lys Glu Arg Leu
            485             490             495
```

```
Gly Cys His Pro Gln Thr Gly Phe Ala Asp Ile Gln Gly His Pro Phe
            500             505             510

Phe Arg Asn Val Asp Trp Asp Met Met Glu Gln Lys Gln Val Val Pro
        515             520             525

Pro Phe Lys Pro Asn Ile Ser Gly Glu Phe Gly Leu Asp Asn Phe Asp
    530             535             540

Ser Gln Phe Thr Asn Glu Pro Val Gln Leu Thr Pro Asp Asp Asp Asp
545             550             555             560

Ile Val Arg Lys Ile Asp Gln Ser Glu Phe Glu Gly Phe Glu Tyr Ile
            565             570             575

Asn Pro Leu Leu Met Ser Ala Glu Glu Cys Val
        580             585
```

```
<210>   12
<211>   592
<212>   PRT
<213>   Homo sapiens

<400>   12

Met Pro Ser Arg Thr Asp Pro Lys Met Glu Gly Ser Gly Gly Arg Val
1               5               10              15

Arg Leu Lys Ala His Tyr Gly Gly Asp Ile Phe Ile Thr Ser Val Asp
            20              25              30

Ala Ala Thr Thr Phe Glu Glu Leu Cys Glu Glu Val Arg Asp Met Cys
        35              40              45

Arg Leu His Gln Gln His Pro Leu Thr Leu Lys Trp Val Asp Ser Glu
    50              55              60

Gly Asp Pro Cys Thr Val Ser Ser Gln Met Glu Leu Glu Glu Ala Phe
65              70              75              80

Arg Leu Ala Arg Gln Cys Arg Asp Glu Gly Leu Ile Ile His Val Phe
            85              90              95

Pro Ser Thr Pro Glu Gln Pro Gly Leu Pro Cys Pro Gly Glu Asp Lys
```

```
                    100                     105                     110

Ser Ile Tyr Arg Arg Gly Ala Arg Arg Trp Arg Lys Leu Tyr Arg Ala
        115             120             125


Asn Gly His Leu Phe Gln Ala Lys Arg Phe Asn Arg Arg Ala Tyr Cys
        130             135             140


Gly Gln Cys Ser Glu Arg Ile Trp Gly Leu Ala Arg Gln Gly Tyr Arg
145             150             155             160


Cys Ile Asn Cys Lys Leu Leu Val His Lys Arg Cys His Gly Leu Val
            165             170             175


Pro Leu Thr Cys Arg Lys His Met Asp Ser Val Met Pro Ser Gln Glu
            180             185             190


Pro Pro Val Asp Asp Lys Asn Glu Asp Ala Asp Leu Pro Ser Glu Glu
            195             200             205


Thr Asp Gly Ile Ala Tyr Ile Ser Ser Ser Arg Lys His Asp Ser Ile
210             215             220


Lys Asp Asp Ser Glu Asp Leu Lys Pro Val Ile Asp Gly Met Asp Gly
225             230             235             240


Ile Lys Ile Ser Gln Gly Leu Gly Leu Gln Asp Phe Asp Leu Ile Arg
            245             250             255


Val Ile Gly Arg Gly Ser Tyr Ala Lys Val Leu Leu Val Arg Leu Lys
            260             265             270


Lys Asn Asp Gln Ile Tyr Ala Met Lys Val Val Lys Lys Glu Leu Val
            275             280             285


His Asp Asp Glu Asp Ile Asp Trp Val Gln Thr Glu Lys His Val Phe
            290             295             300


Glu Gln Ala Ser Ser Asn Pro Phe Leu Val Gly Leu His Ser Cys Phe
305             310             315             320


Gln Thr Thr Ser Arg Leu Phe Leu Val Ile Glu Tyr Val Asn Gly Gly
            325             330             335
```

```
Asp Leu Met Phe His Met Gln Arg Gln Arg Lys Leu Pro Glu Glu His
            340             345             350

Ala Arg Phe Tyr Ala Ala Glu Ile Cys Ile Ala Leu Asn Phe Leu His
        355             360             365

Glu Arg Gly Ile Ile Tyr Arg Asp Leu Lys Leu Asp Asn Val Leu Leu
    370             375             380

Asp Ala Asp Gly His Ile Lys Leu Thr Asp Tyr Gly Met Cys Lys Glu
385             390             395             400

Gly Leu Gly Pro Gly Asp Thr Thr Ser Thr Phe Cys Gly Thr Pro Asn
            405             410             415

Tyr Ile Ala Pro Glu Ile Leu Arg Gly Glu Glu Tyr Gly Phe Ser Val
            420             425             430

Asp Trp Trp Ala Leu Gly Val Leu Met Phe Glu Met Met Ala Gly Arg
        435             440             445

Ser Pro Phe Asp Ile Ile Thr Asp Asn Pro Asp Met Asn Thr Glu Asp
    450             455             460

Tyr Leu Phe Gln Val Ile Leu Glu Lys Pro Ile Arg Ile Pro Arg Phe
465             470             475             480

Leu Ser Val Lys Ala Ser His Val Leu Lys Gly Phe Leu Asn Lys Asp
            485             490             495

Pro Lys Glu Arg Leu Gly Cys Arg Pro Gln Thr Gly Phe Ser Asp Ile
            500             505             510

Lys Ser His Ala Phe Phe Arg Ser Ile Asp Trp Asp Leu Leu Glu Lys
        515             520             525

Lys Gln Ala Leu Pro Pro Phe Gln Pro Gln Ile Thr Asp Asp Tyr Gly
    530             535             540

Leu Asp Asn Phe Asp Thr Gln Phe Thr Ser Glu Pro Val Gln Leu Thr
545             550             555             560
```

20

```
Pro Asp Asp Glu Asp Ala Ile Lys Arg Ile Asp Gln Ser Glu Phe Glu
                565                 570                 575

Gly Phe Glu Tyr Ile Asn Pro Leu Leu Leu Ser Thr Glu Glu Ser Val
                580                 585                 590
```

1